7.0 EVALUATION AND COMPARISON OF ALTERNATIVES

A detailed evaluation and comparison of the five alternatives that are discussed in Section 6 are presented in the Final Feasibility Study Report (April 2004). Tables 4 and 5 are taken from this FS report; Table 4 shows a summary of the detailed evaluation while Table 5 shows a qualitative/quantitative comparison of the five alternatives.

The following is a summary of the evaluation and comparison of Alternatives 1 through 5:

7.1 Threshold Requirements

Protect human health and the environment

The cap in Alternative 1, along with institutional controls, would prevent direct contact with and ingestion of PCB contaminated soils. Solidification of PCB contaminated soils and a cap under Alternative 2 would also prevent direct contact and ingestion of contaminated soils. The potential for future migration of chemical to ground water is not eliminated under Alternatives 1 and 2. PCB contaminated soils would be excavated under Alternatives 3, 4, and 5. All PCB contaminated soils with concentrations above 10 mg/Kg would be excavated under Alternatives 4 and 5. Soil underneath the building would remain in Alternative 3 until the building is removed and additional soils would be excavated. Excavation of the PCB contaminated soils would prevent direct contact with and ingestion of impacted soils, and would eliminate the potential for future migration of PCBs to ground water.

Comply with cleanup standards

The PCBs cleanup level would not be met at the point of compliance for Alternatives 1 and 2; however, compliance with cleanup standards could be attained under the requirements of WAC 173-340-740(6)(f). Under this section, cleanup actions involving containment may be determined to comply with cleanup standards if: the selected remedy is permanent to the maximum extent practicable; the cleanup action is protective of human health; the cleanup action is demonstrated to be protective of terrestrial ecological receptors; institutional controls are put in place; compliance monitoring and periodic reviews are designed to ensure the long-term integrity of the containment system; and, the types, levels, and amount of hazardous substances remaining on-site and the measures that will be used to prevent migration and contact with those substances are specified in the draft cleanup action plan.

The PCBs cleanup level would be met at the points of compliance for the industrial properties under Alternatives 3, 4, and 5. The cleanup level of 1 mg/kg would not be met in the alleyway but cleanup standards could be complied with under WAC 173-340-740(6)(f).

Comply with Applicable State and Federal Laws

All the five alternatives could comply with the applicable and federal laws that are listed in Table 6.

Provide for Compliance Monitoring

Protection monitoring would be conducted to confirm that human health and the environment are adequately protected during implementation of the cleanup action. Confirmational sampling under Alternatives 3, 4, and 5 would be conducted to verify that soils remaining after the excavation are less than 10 mg/Kg.

7.2 Other Requirements

Use permanent solutions to the maximum extent practicable

Protectiveness: This involves the overall protectiveness of human health and the environment. Alternative 5 ranks the highest because all PCB-contaminated soil with concentrations above the industrial cleanup level would be removed from the Site and the PCBs would be destroyed by incineration off-site. Like Alternative 5, Alternative 4 would involve the excavation of all PCB-contaminated soil with concentrations above the cleanup level. Alternative 4 ranks lower than Alternative 5 because the PCBs would not be destroyed but would be contained off-site. Alternative 3 ranks lower than Alternative 4 since PCB-contaminated soils would still remain underneath the building. Alternative 1 ranks the lowest in protectiveness since no PCBs would be removed and would just be contained on Site. Alternative 2, where the PCBs would be immobilized and contained on Site, ranks higher than Alternative 1.

Permanence: This is the degree to which the alternative permanently reduces the toxicity, mobility or volume of the hazardous substances. Alternative 5 ranks the highest in terms of permanence since the PCBs in soils that are excavated would be permanently destroyed by the incineration process. Alternative 4 ranks less than Alternative 5 because the PCBs in the soils that are excavated would be not destroyed but would be contained off-site. Alternative 3 ranks less than Alternative 4 since soils underneath the building would not be immediately removed. Alternative 1 ranks the lowest in permanence as this alternative would not reduce the toxicity, mobility, or volume of the PCBs in soils. Alternative 2, because the mobility of PCBs would be reduced through solidifaction/stabilization, ranks higher than Alternative 1.

Cost: Table 7 is a summary of the costs of the five alternatives. The Final Feasibility Study Report presents the cost estimates for the various alternatives. These costs figures are preliminary, order-of-magnitude estimates, which are developed primarily for the purpose of comparing remedial alternatives during the remedy selection. Actual quantities, dimensions, and engineering parameters, and cost estimates will be determined in the remedial design phase. Alternative 1 is the least costly and Alternative

5 is the most expensive. Alternative 3 costs more than Alternative 4 The removal of one drywell and the underground storage tank inside the building in Alternative 3 would cost more if the building remains, versus removing these following demolition of the building.

Long-term Effectiveness: This includes the degree of certainty that the alternative will be successful, the reliability of the alternative during the period of time hazardous substances are expected to remain on-site at concentrations that exceed cleanup levels, the magnitude of residual risk, and the effectiveness of controls required to manage treatment residues or remaining risks. Following the guidance under WAC 173-340-360(3)(e)(iv), Alternative 5, which involves the destruction of PCBs, ranks the highest in terms of long-term effectiveness. Alternative 4 ranks next to Alternative 5 because this entails off-site disposal in an engineered, lined, and monitored facility. Alternative 3, which is Alternative 4 without immediate building removal, ranks a little less than Alternative 4. Alternative 1, which is on-site isolation or containment, ranks the lowest in terms of long-term effectiveness. Alternative 2 ranks higher than Alternative 1

Management of short-term risks: This is a measure of the risk to human health and the environment during construction and implementation, and the effectiveness of measures that would be undertaken to manage such risks. For all the alternatives, remedial workers risk exposure to dust or gases For Alternatives 3, 4, and 5, off-site disposal would result in certain exposure risks through fugitive dust emissions or spills in transit. These risks are managed through proper handling and treatment methods. Alternatives 4 and 5 rank the lowest in terms of short-term risks because of the building demolition, soil excavation, and the soil transport to the landfill or to the incinerator Alternative 3 scores higher because no immediate building demolition would take place. Alternative 2 involves short-term risks associated with soil mixing and would rank higher than Alternative 3. Alternative 1 ranks the highest since no soil excavation and transportation are involved.

Implementability: This evaluates the ability to implement the alternatives at the Site. Alternative 1 is the easiest to implement. Alternative 2 ranks next followed by Alternatives 4 and 5 It is harder to implement Alternative 3 than Alternative 4 or Alternative 5 because work inside the building is required

Public concerns consideration: The public had an opportunity to comment on these five alternatives during the public comment period for the draft Feasibility Study Report No written comments were received during this period.

Based on the analysis of these requirements, Ecology has determined that the alternative that is permanent to the maximum extent practicable is Alternative 4, as illustrated in Table 5.

Provide for reasonable restoration time frame

Criteria for evaluating reasonable restoration time frame are outlined in WAC 173-340-360(4) and are listed in Section 5.3. Alternatives 4 and 5 rank the highest in terms of

providing for reasonable restoration time frame. Alternative 3 ranks a little lower since contaminated soils would be left underneath the building until the building is removed and soils underneath would be excavated. Alternative 2 scores lower since the PCBs in soils are immobilized and contained but not removed. Alternative 1 scores the lowest.

Consider public comments

The draft FS Report was made available for public review and comment. No written comments were received; the Feasibility Report was finalized in April 2004. The public would have the opportunity to comment on the proposed cleanup action in the Draft Cleanup Action Plan.

7.3 Expectations for Cleanup Action Alternatives

Under WAC 173-340-370, it is Ecology's expectation that all hazardous substances will be destroyed, detoxified, and/or removed to concentrations below cleanup levels throughout sites containing small volumes of hazardous substances, in order to minimize the need for long-term management of contaminated materials. Alternatives 3, 4, and 5 would meet this expectation; Alternatives 1 and 2 would not.